



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10**

1200 Sixth Avenue, Suite 900  
Seattle, Washington 98101-3140

April 23, 2008

Reply To: OEA095

**MEMORANDUM**

**SUBJECT:** Recommendation to Include Risk Evaluation of the Breast Feeding Pathway in the Portland Harbor Human Health Risk Assessment (HHRA) and RI/FS

**FROM:** Government Risk Assessment Team  
Dana Davoli                      Mike Poulsen                      David Farrer  
EPA Region 10                      Oregon DEQ                      Oregon DHS

**TO:** Deb Yamamoto  
Unit Manager, Site Cleanup Unit 2

One of the remaining human health risk issues for the Portland Harbor Superfund site is whether infant exposure from breastfeeding should be included in the Portland Harbor Human Health Risk Assessment (HHRA) and if this pathway should be used to develop PRGs/RGs. The government risk assessment team has determined that it is feasible to estimate exposure and risk for breastfed infants in the Portland Harbor Superfund HHRA and recommends that this important exposure pathway be included. The purpose of this memo is to summarize our recommendations, provide a discussion of the issues for Portland Harbor and other programs if this scenario is included, provide a brief summary of the methods and results for Portland Harbor, and discuss next steps.

**(1) Brief Summary of Major Issues and Recommendations:**

- (a) Portland Harbor Superfund Site - Infant exposure from breastfeeding should be included in the Portland Harbor HHRA. If included, this pathway should be used to develop PRGs/RGs. Given the unique nature of the exposure pathway, the HHRA should include a discussion of the benefits of breastfeeding.
- (b) The recommended methodology to characterize risks for children consuming breast milk has been prepared as a draft memorandum. This memorandum would be provided to the Lower Willamette Group (LWG) for use in the Portland Harbor HHRA once a decision has been made to include this scenario.
- (c) Region 10 EPA should include this pathway of exposure in HHRA's for other sites (Superfund and RCRA) where mother's exposure to bioaccumulatives in sediment, soil, and other media could present a risk to breastfeeding infants. The potential impact on

other programs (e.g. WQC, MCLs) should be evaluated.

## **(2) Reasons for Inclusion of Breastfeeding in the Portland Harbor Human Health Risk Assessment (HHRA):**

### **Pros:**

- Breast feeding is a relevant exposure pathway at the Portland Harbor site, and at many other sites with bioaccumulating chemicals.
- There are reasonable risk assessment analytical tools to evaluate risks from breast feeding. EPA has guidance for evaluating this pathway in *Human Health Risk Assessment Protocol for Hazard Waste Combustion Facilities* and it is included in EPA's 1997 *Exposure Factors Handbook* and the EPA's 2002 *Child-Specific Exposure Factors Handbook*. Region 10 (Dana Davoli and Marcia Bailey) has been discussing development of guidance for this pathway with Regions 1 and 2.
- This pathway has been included in the risk assessments for the GE/Housatonic River site, numerous evaluations of hazardous waste combustion facilities, including those in Region 10, and in EPA's draft dioxin reassessment document.
- For the Portland Harbor site, the highest calculated non-cancer hazard quotients for PCBs would be from breast-feeding, and the calculated cancer risk to the breast-feeding infant are equivalent to the cancer risks to the adult from the fish consumption pathway. Because PCBs are the dominant risk driver for the site, the breast feeding pathway could become the most important for establishing preliminary cleanup levels for PCBs and possibly other bioaccumulatives.
- The importance of contaminants in breast milk has been recognized by public health professionals for years. The DHS fish advisory for the lower Willamette River already states that:

*Women of childbearing age, particularly pregnant or breastfeeding women, should avoid eating resident fish from Portland Harbor, especially carp, bass and catfish.*

Adding the breastfeeding scenario to the PH HHRA would provide quantitative support for this public health advisory.

- ODEQ is considering adding this scenario to their risk assessment guidance for multiple media under the State's Superfund law and to the ODEQ's *Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment* (April 2007). The ODEQ Director was briefed on this issue on April 18. OR DHS will likely issue a health consultation for nursing mothers for PH and possibly other sites (e.g., Bradford Island). OR DHS is expected to ask the OR legislature for money to conduct breast milk monitoring in OR.

- As a part of its PH Health Consultation, DHS would like to include a request asking the LWG to fund them to conduct a sustained community outreach campaign directed towards women of child-bearing age who are suspected high fish consumers in PH. Although fish consumption advice and community outreach are expected to be a component of the remedy for the PH site, including the breastfeeding pathway in the HHRA further supports the need for such an outreach campaign.

### **Other Considerations:**

- The breast milk consumption exposure scenario is unlikely to drive cleanup levels. The final cleanup levels for chemicals such as PCBs, dioxins and DDT will likely be determined based on background levels, not risk-based levels. Driving the risk-based values lower will not advance our cleanup.
- Given the estimated risks from breastfeeding as well as the numerous benefits to both the child and mother, EPA would require the LWG to include in the HHRA language on the benefits associated with breast feeding and the need to follow the DHS fish advisory. We do not normally include benefit language in our HHRA's and have not done so for fish consumption. However, language on the benefits associated with breast feeding was included in the Housatonic HHRA section on breastfeeding.
- The current fish advisory already highlights pregnant and nursing mothers and we will need to rely on fish advisories as a component of our remedy. It may be more appropriate to handle this pathway through Oregon's Department of Human Services which is in a far better position than Superfund to present information about the risks and benefits associated with breast feeding broadly and working to educate the public about the risks and benefits associated consuming fish collected from Portland Harbor.
- We are in the final stages of negotiating the methodologies and assumptions for the PH HHRA and are to resolve outstanding issues by June 1. Although the breastfeeding scenario is included in the PH RI/FS Workplan, EPA has not provided the methodologies to be used to the LWG. This could be a contentious issue, as could the development of preliminary remedial goals and the request from DHS for outreach resources.
- If the breast milk pathway is added to the PH HHRA, it should be applicable to other hazardous waste sites in Region 10 (i.e., Superfund and RCRA) and the rest of the nation, and could lead to questions for other programs (e.g. MCLs, AWQC)

### **(3) Risk Assessment Methodology and Characterization of Risk:**

- Methodology for estimating a breastfeeding child's exposure for PH: calculate contaminant intake for a mother eating fish from PH; calculate the concentration

of contaminant (e.g., PCBs) in breast-milk; calculate infant exposure assuming consumption of breast-milk.

- Selection of the appropriate averaging time and toxicity values has an impact on the exposure calculated for a breastfed child.
- Characterization of the impacts of this pathway can be done by either (1) comparing estimated exposures of breastfed infants at PH to those infants consuming breast milk with background levels of contaminants (Housatonic approach); (2) characterize risk using Superfund guidance, that is, calculate cancer risks and hazard quotients (approach used in Exposure Factors Handbook, Combustion Guidance), or (3) do both. **Attachment 1** provides a brief summary of the results using both methods.
- A draft memorandum has been prepared by Region 10 EPA, ODEQ and OR DHS that would direct the LWG on how to conduct a risk assessment for breast feeding and how to present the public health issue (**Attachment 2**). A related health consultation is being reviewed at ATSDR headquarters.

### **(3) Next Steps (need to discuss timing)**

- Decision from Region 10 Superfund management as to whether the breast milk pathway should be included in the PH HHRA and in other Region 10 Superfund sites.
- Review of the PH draft memorandum on breastfeeding and of this issue summary memo by risk assessors, managers, and attorneys for both Superfund and RCRA. Technical review would also be requested from a small number of Regional risk assessors outside of Region 10 as well as a small number of EPA scientists from ORD.
- Submit PH draft memorandum to LWG.
- Decide if other Region 10 programs, the Region 10 EPA RA, EPA headquarters, and other EPA regions need to be included in these discussions.